

JAPAN

EDICT OF GOVERNMENT

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JIS B 6546 (1991) (English): Wide belt sanders --
Test and inspection methods

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*The citizens of a nation must
honor the laws of the land.*

Fukuzawa Yukichi

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JAPANESE INDUSTRIAL STANDARD

**Wide belt sanders —
Test and inspection methods**

JIS B 6546—1991

Translated and Published

by

Japanese Standards Association

In the event of any doubt arising,
the original Standard in Japanese is to be final authority.

JAPANESE INDUSTRIAL STANDARD

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Wide belt sanders - Test and inspection
methods

B 6546-1991

1. Scope

This Japanese Industrial Standard specifies the test methods relating to the functions, running performances and rigidities, and accuracies and machining accuracy inspection methods for the wide belt sanders of 300 mm or over to 2000 mm or under in effective length⁽¹⁾ of the driving rolls.

Note (1) The maximum width of grindable workpieces.

Remarks 1. The wide belt sander means the machine which grinds the surfaces of automatically fed ply wood and the like by means of a sheet of endless abrasive cloth or paper which has been laid on two or more rotating drum pulleys over their total length. There are also machines which have been assembled of two or more sets.
(See JIS B 0114)

2. The applicable standards to this Standard shall be as given in the following:

JIS B 0114 Glossary of terms for wood working machinery

JIS B 0905 Balance quality of requirements rigid rotors

JIS B 6507 General code of safety for wood working machinery machinery

JIS B 6521 Methods of measurement for noise emitted by wood working machinery

JIS R 6251 Abrasive cloths

JIS R 6252 Abrasive papers

3. Units and numerical values given in { } in this Standard are in accordance with the traditional units, and are appended for informative reference.

2. Functional test methods

The functional tests of the wide belt sanders shall be in accordance with Table 1.

Table 1. Functional tests

No.	Test item	Test method
1	Electrical equipment	Before and after the running test, examine the insulation conditions once each.
2	Start, stop and running operation of driving roll	Attach abrasive cloth or paper, carry out 10 times start and stop repeatedly at an appropriate rotational speed of the driving roll to examine the smoothness and reliability of actions.
3	Changing operation of rotational speed of driving roll	Change rotational speed of the driving roll on overall rotational speeds of marking to examine the smoothness of actions and reliability of indications of the operating device.
4	Start, stop and running operation of feed device	At an appropriate feed speed, carry out 10 times of start and stop repeatedly to examine the smoothness and reliability of actions.
5	Changing operation of feed speed	Change speeds on overall marked speeds; and for the variable speed type, change speed on three feed speeds, the minimum, intermediate and maximum to examine the smoothness of actions and the reliability of indications of the operating device.
6	Operations of raising and lowering and clamping of table	Raise and lower the table to examine the smoothness and uniformity of actions of table, thoroughly. For the center and both ends of the movement, examine the reliability of clamping and the smoothness of actions of the clamping device.
7	In feed device of driving roll	Raise and lower the driving roll to examine the smoothness of actions and the reliability of indications thoroughly.
8	Attaching and detaching of abrasive cloth or paper	Examine the smoothness and reliability of the attaching and detaching of abrasive cloth or paper.
9	Beam supporting device	Examine the smoothness and reliability of the function.
10	Platen or pad attaching device	Examine the smoothness and reliability of the function.
11	Pressure roll device	Examine the smoothness and reliability of the function.

Table 1 (Continued)

No.	Test item	Test method
12	Brushing device	Examine the smoothness and reliability of the function.
13	Belt cleaning device	Examine the smoothness and reliability of the function.
14	Safety device	Examine the reliability of the safety function for workers and protective function for machine (See JIS B 6507).
15	Lubrication device	Examine the reliability of the function such as oiltightness and proper distribution of oil quantity.
16	Pneumatic device	Examine the reliability of the function such as airtightness and pressure regulation.
17	Accessory equipments	Examine the reliability of the function.

Remarks: For the wide belt sanders which are not provided with the said function, the test items corresponding to those in Table 1 shall be omitted.

3. Running test methods

3.1 No-load running test Rotate the driving roll, continue running for 30 to 60 minutes, measure the required electric power and noise after the bearing temperatures have been stabilized, and record on respective items specified in the recording Format 1 of Table 2 and check for abnormal vibration by touch.

Furthermore, the measurement of the noise shall be in accordance with JIS B 6521.

Table 2. Recording format 1

No.	Time of measurement hour minute	Rotational speed of driving roll r/min {rpm}		Feed speed m/min	Rotational speed of brush r/min {rpm}	Primary pneumatic pressure MPa {kgf/cm ² }	Bearing temperature °C		Required electric power		Noise dB (A)	Room temperature °C	Description
		Marking	Actual measurement				Measuring place		Left	Right			
							Driving roll						
							Contact roll						
							Tension roll			-	-	-	
							Idle roll			-	-	-	
							Pressure roll(²)			-	-	-	
							Feed roll						
							Brush						

Note (2) The pressure roll means a feed roll located on the lower part or upper part of the contact roller.

- Remarks
1. For the wide belt sanders provided with the variable device of rotational speed of driving roll, the rotational speeds under at least two conditions including the maximum rotational speed shall be recorded.
 2. The measuring conditions of noise shall be recorded in the description column.
 3. The names of the respective rolls in the measuring places of bearing may be altered by the type of machine.

3.2 Load running test Grinding the test specimen, measure the required electric power and noise, record on respective items specified in the Recording Format 2 of Table 3, and check for abnormal vibration and surface condition by touch.

For the measurement of the required electric power, carry out the test by changing the depth of cut at a definite feed speed or by changing the feed speed at a definite depth of cut.

The measurement of the noise shall be in accordance with JIS B 6521.

Table 3. Recording format 2

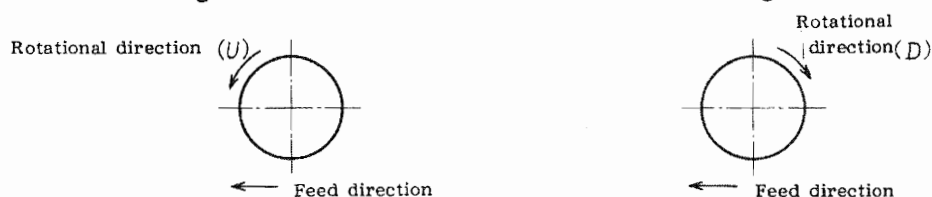
No.	Test specimen			Species of tree or type of wood	Surface conditions before and after grinding	Moisture content %	Abrasive cloth and paper ⁽¹⁾		Grinding conditions				Ground quantity mm	Required electric power										Noise dB (A)	Humidity %	Description																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	Dimensions						Properties of abrasive	Particle size of abrasive	Length mm	Width mm	Rotational speed of driving roll r/min (rpm)	Feed rate m/min		Depth of cut ⁽⁴⁾ mm	Rotational direction of driving roll ⁽⁵⁾	Voltage V	Driving roll	Feed device	Input				Grinding power $P_2 - P_1$ kW																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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Notes (3) It shall be in accordance with the indicating method of JIS R 6251 or JIS R 6252.

(4) It means the interval between the contact roll, platen, or pad and the pressure roll, surface plate, etc.

(5) In the column of the rotational direction of the driving roll, a symbol shall be recorded in accordance with Fig. 1.

Fig. 1. Rotational direction of the driving roll



Remarks: The measuring conditions of the noise shall be recorded in the column.

4. Rigidity test method

The rigidity test of the wide belt sander shall be as given in Table 4.

Table 4. Rigidity test

No.	Test item	Measuring method	Diagram for measuring method
1	Rigidity of driving roll and table	Apply a test indicator fixed to table to the center of the driving roll, apply the load (P) in vertical direction between the driving roll and the table (roll) ⁽⁶⁾ and measure the relative displacement between the driving roll and the table.	

Note (⁶) The position to which the load is applied shall be as near to the center of the driving roll as possible, and the distance from the fixed end of the driving roll shall be recorded.

- Remarks 1. The rigidity test of the machines of the same design shall be represented by the test results of a representative set which has been tested, and for others, may be omitted.
2. The magnitude of the load (P) shall be the recommended value by the manufacturer, and its value shall be recorded.
3. This measurement shall be carried out when the bearing temperatures are stabilized after rotating the driving roll.

5. Accuracy inspection method

5.1 Static accuracy inspection The static accuracy inspection of the wide belt sander shall be in accordance with Table 5.

Table 5. Static accuracy inspection

Unit: mm

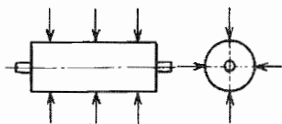
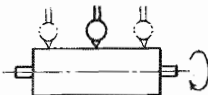
No.	Inspection item	Measuring method	Diagram for measuring method	Permissible value	
				Effective length of driving roll	
				1000 or under	Over 1000
1	Cylindricity of driving roll	<p>Among the maximum differences of diameters of the driving roll⁽⁷⁾ which have been measured respectively in two planes vertical to each other including the axis, consider the larger value as the measured value.</p> <p>These measurement shall be made at least at 3 places, the center and both ends of the driving roll⁽⁸⁾.</p>		0.03	0.04
2	Run out of driving roll	<p>Apply a test indicator to the outer peripheral surface of the driving roll⁽⁷⁾, rotate the driving roll manually, consider the maximum difference of the readings of the test indicator during rotation as the measured value.</p> <p>The measurement shall be made at three places, the center and both ends⁽⁸⁾ of the driving roll.</p>		0.03	0.04

Table 5 (Continued)

Unit: mm

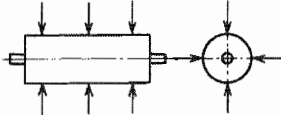
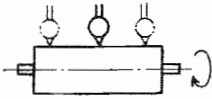
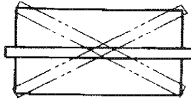
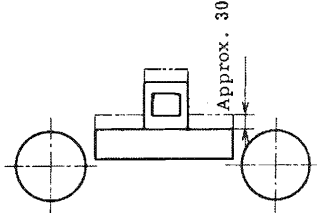
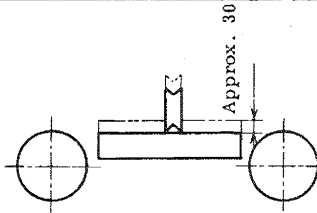
No.	Inspection item	Measuring method	Diagram for measuring method	Permissible value	
				Effective length of driving roll	
				1000 or under	Over 1000
3	Cylindricity of roll ⁽⁹⁾	<p>Among the maximum differences of diameters of the roll which have been measured respectively in two planes vertical to each other, including the axis, consider the larger value to be the measured value.</p> <p>The measurement shall be made at least of three places, the center and both ends⁽⁸⁾ of the roll.</p>		<p>0.04 for feed roll</p> <p>0.03 for other rolls</p>	<p>0.06 for feed roll</p> <p>0.04 for other rolls</p>
4	Run out of roll ⁽⁹⁾	<p>Apply a test indicator to the outer peripheral surface of the roll, rotate the roll manually and consider the maximum difference of the readings of the test indicator during the rotation as the measured value.</p> <p>The measurement shall be made at three places, the center and both ends⁽⁸⁾ of the roll.</p>		<p>0.04 for feed roll</p> <p>0.03 for other rolls</p>	<p>0.06 for feed roll</p> <p>0.04 for other rolls</p>

Table 5 (Continued)

Unit: mm

No.	Inspection item		Measuring method	Diagram for measuring method	Permissible value	
					Effective length of driving roll	
					1000 or under	Over 1000
5	Straightness of upper surface of table		Place a straightedge in vertical direction to the feed direction and on the diagonal lines of the upper face of the table, measure clearances with a feeler gauge, and consider the maximum value thereof as the measured value.		0.05 per 1000	
6	Parallelism of up and down motions of table	In back and forward direction	Place a precision level in parallel to the feed direction on the surface of the table, raise it to approx. 30 mm from the lower position, and consider the maximum difference of the readings of the precision level during the time as the measured value.		0.03/m	
		In right and left direction	Place a precision level in vertical to the feed direction on the surface of the table, raise it approx. 30 mm from the lower position, and consider the maximum difference of the readings of the precision level during the time as the measured value.		0.03/m	

Notes (7) The driving roll to be attached with the cushion body such as felt, foam rubber or the like shall be measured prior to the attaching.

(8) Measurement shall be made avoiding the portion " shear drop".

(9) This measurement shall also be made on the tension roll, idle roll, pressure roll and feed roll other than the driving roll.

On the other rolls having the same functions, this measurement shall be made.

Remarks: For the wide belt sander which is not provided with the said function, the inspection item corresponding to this in Table 5 may be omitted.

5.2 Dynamic accuracy inspection The dynamic accuracy inspection of the wide belt sander shall be in accordance with Table 6.

Table 6. Dynamic accuracy inspection

Unit: mm/s

No.	Inspection item	Measuring method	Permissible value
1	Balance quality of driving roll ⁽¹⁰⁾	<p>Measure the magnitude of unbalance by a balancing tester, obtain the magnitude of specific unbalance from the mass of the driving roll, and calculate the balance quality (B) from this and rotational speed⁽¹¹⁾.</p> $B = \frac{en}{9.55}$ <p>where e: magnitude of specific unbalance (mm) n: rotational speed (r/min {rpm})</p>	6.3

Note (10) This measurement shall also be made on the tension roll and idle roll.

On the other rolls having the same function, this measurement shall be made.

(11) It shall be the two-plane balancing (See JIS B 0905).

Informative reference: The permissible value of No. 1 is the Grade G 6.3 of the balance quality specified in JIS B 0905.

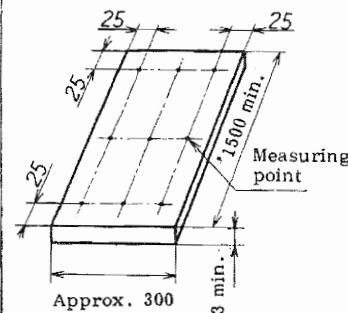
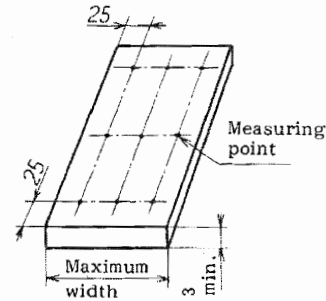
6. Machining accuracy inspection method

The machining accuracy inspection of the wide belt sander shall be in accordance with Table 7.

Table 7. Machining accuracy inspection

Unit: mm

No.	Inspection item	Measuring method	Diagram for measuring method	Permissible value	
				Effective length of driving roll	
				1000 or under	Exceeding 1000
1	Accuracy of thickness	Type of machine intended for regulating thickness	Grind the workpiece having width approximately equal to the maximum grindable width of the machine, measure the thicknesses of the measuring points ⁽¹²⁾ with an external micrometer, and consider the maximum difference thereof as the measured value.	0.08	0.10
		Type of machine not intended for regulating thickness	Grind the test specimen(s) of which thicknesses of the measuring points ⁽¹²⁾ have been measured with an external micrometer after arranging specimen(s) in the maximum grindable width of the machine, measure the thicknesses of the measuring points by the outside micrometer, and consider the subtracted value of the maximum difference thereof from the maximum difference before grinding as the measured value.		



Note (¹²) The measuring points shall be in accordance with the diagram for measuring method.

- Remarks
1. For the wide belt sander which is not provided with the said function, the inspection item corresponding to this in Table 7 may be omitted.
 2. The test specimens shall be of the same species of tree, of the same moisture content, and be subjected to the necessary pre-processing.
 3. The abrasive cloth or paper shall be those recommended by manufacturer.

Reference Standards:

JIS B 6501-Test Code for Performance and Accuracy of Wood Working Machinery

JIS R 6004-Glossary of Terms and Marks Used in Abrasive, Grinding Wheel and Coated Abrasive

JIS Z 8203-SI Units and the Use of Their Multiples and of Certain Other Units